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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/738,591	12/15/2000	Jim Otter	60,246-116	1229
26096	7590	01/03/2005	EXAMINER	
CARLSON, GASKEY & OLDS, P.C. 400 WEST MAPLE ROAD SUITE 350 BIRMINGHAM, MI 48009			PARKER, FREDERICK JOHN	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/738,591

Applicant(s)

OTTER, JIM

Examiner

Frederick J. Parker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 22, 23 and 25-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 22, 23, 25-29 and 31-35 is/are rejected.
- 7) ☒ Claim(s) 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 11/30/04 has been entered.

Claim Objections

2. Claim 30 is objected to because of the following informalities: line 2, "zironia" is a misspelling. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 27 (amended) is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for applying a coating of maleic anhydride to surface of polar particulates already applied to a film, does not reasonably provide enablement for applying particulates coated with maleic anhydride to the film, etc. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to carry

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out the invention commensurate in scope with these claims. See original claim 27 and supporting portions of the specification.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 25 is vague and indefinite because the specific polar particulates of claim 1 do not possess germicidal properties.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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Claims 1-4,22,23,26,29,31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al US 4848314 in view of Kaneko et al US 4421789 and further in view of Rickert Jr US 4181773 or Stewart US 4921646 or Steele et al US 5264250 (hereafter the “alternate references”).

Bentley teaches a heat exchanger part formed by laminating a corrosion-resistant, stable thermoplastic polymer sheet material to a metal surface (carbon steel, aluminum, etc), col. 3, 43-col. 4, 43. In service, the resultant part permits flow of condensed water which is removed from the unit in the presence of a corrosive flue gas, per claims 33-34. Use of polar particulates on the sheet material is not cited.

Kaneko et al teaches forming similar heat exchanger parts comprising a metal substrate onto which is applied a thermoplastic, corrosion-resistant polymer coating film, and then applying thereto polar silica particles, in any convenient manner, to increase wettability of the surface and hence process efficiency (col. 1, 30-50; col. 2, 52-63; col. 3, 3-37). Application may be by powders, an aqueous suspension, sol solution, etc. As noted in Example 8, resin-coated panels were squeezed and dried, followed by application of the silica in sol form (a sol being a liquid dispersion of very fine-sized particulates), followed by roller squeezing (same as “embedding...with a rolling pressure”) and heating (necessarily including cooling to provide utility to the article), according to claims 3-4.

Both references are directed to forming heat-exchanger parts having surfaces which are corrosion resistant by virtue of a thermoplastic polymeric surface layer (per claim 2) and demonstrate wettability to allow condensate flow. While Bentley et al does not teach application of polar particles, Kaneko et al explicitly teaches to apply such particles for improved wetting,

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such that one of ordinary skill would have been motivated to apply such polar particles, e.g. silica, to the thermoplastic sheet material of Bentley et al to provide the advantage of improved wetting and process efficiency. While additional polar particulates are not taught, the alternate references teach additional inorganic polar particulates, as follows;

Steele teaches coating heat transfer surfaces to provide wetting, the coating comprising inorganic particulates of silica and/ or calcium silicate (= wollastonite), col. 3, 6-38.

Rickert Jr teaches coating aluminum surfaces to render them wettable by applying coatings comprising alumina, etc, col. 1, 51 to col. 2, 14.

Stewart teaches on col. 3, 1-4, that talc, glass (= silica), etc have polar properties.

Since the alternate references teach other polar materials including those used to coat surfaces to enhance wetting, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute one or more of wollastonite, alumina, or talc in place of silica as taught by Bentley et al in view of Kaneko et al because the alternate particulates would have been expected to improve the wettability of surfaces to which they are applied.

As to claim 22, Kaneko et al expressly discloses olefin type resin films (col. 2, line 61), encompassing conventional polyolefins. Kaneko also teaches use of a pressure roller assembly for incorporating particles per claim 23. Surface tension/ energy of the film comprising the polar silica particulates is necessarily increased in both the Applicants invention and combination of references of the rejection to increase flow/ wettability of condensed water as taught by Kaneko et al (col. 3, 23-53) per claim 26.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Bentley et al by incorporating polar (silica) particles onto the corrosion-resistant thermoplastic as taught by Kaneko et al and further incorporate the other particulate materials taught by the alternate references to improve wettability and overall process efficiency of transfer surfaces.

2. Claims 5,28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al US 4848314 in view of Kaneko et al US 4421789 and further in view of the alternate references and further in view of McCulloch et al US 3973510.

Bentley et al, Kaneko, and the alternate references et al are cited for the same reasons discussed above, which are incorporated herein. Applying polar particulates by pressing them into an adhesive applied to the surface is not cited.

McCulloch et al is introduced because it discloses the concept of applying silica particles to a binder coated surface to provide thereon a distribution of particles which lowers the coefficient of friction between water and surfaces, in this case, a seagoing vessel. The particles are blown into the tacky adhesive or polymeric binder coating (including thermoplastics, col. 4, 31-36), followed by curing (col.2, 15-22). The blowing of the particles into the tacky coating necessarily presses the particles into the adhesive or polymer to cause adhesion. Although not directed to a heat transfer/ exchange component, since both involve the unimpeded flow of water along contacting surfaces, it is the Examiner's position that one of ordinary skill would have looked to analogous particle coating arts which solve the same problems to find ways to attach particles to the heat transfer/ exchange component of Bentley et al in view of Kaneko et al and further in view of the alternate references.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Bentley et al in view of Kaneko et al and further in view of the alternate references by applying the particles to a tacky adhesive layer and curing as taught by McCulloch et al in order to form a polymer-coated surface with polar particles therein.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al US 4848314 in view of Kaneko et al US 4421789 and further in view of the alternate references and further in view of Linford US 6132801.

Bentley et al, the alternate references, and Kaneko et al are cited for the same reasons discussed above, which are incorporated herein. Coating an outer surface of the polar silica particulates is not cited.

Linford teaches on col. 1, 33-54 and col. 5, 1-8 that the application of a polymeric coating on silica and other inorganic particles allows a more robust coating attachment in micro particle/polymer composite materials to prevent de-bonding of the particles. Since the combination of references teaches polar particles, including powders, adhered to a polymeric base, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Bentley et al in view of Kaneko et al and further in view of the alternate references by coating the applied particles as taught by Linford to provide the benefits of a stronger attachment of the particles to the base, thereby reducing de-bonding of the crucial inorganic particles and resulting in a longer useful lifetime of the parts.

4. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al US 4848314 in view of Kaneko et al US 4421789 and further in view of the alternate references and further in view of Hayakawa et al US 6013372.

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Bentley, Kaneko and the alternate references are cited for the same reasons discussed above, which are incorporated herein. Use of other polar particulates, which may be germicidal, are not taught. Hayakawa et al teaches that titanium dioxide may be applied alone, or with other polar particulates, to fins of a heat exchanger to enhance efficiency and preventing surfaces from being clogged by condensate (col. 8, 13-18). Titanium dioxide is inherently a germicide, and is the same germicide material taught by Applicants on page 5, 15-17.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Bentley in view of Kaneko et al and further in view of the alternate references by substituting or adding titanium dioxide particles to the surface of heat exchanger parts as disclosed by Hayakawa because titania is taught to provide the same benefit of enhancing flow of condensate off heat exchange surfaces as well as providing germicidal properties to prevent bacterial build-up.

9. Claim 27 distinguishes over the prior art which does not teach nor suggest an outer coating applied to polar particulates already applied to a heat transfer surface. The claim is rejected under 35 USC 112 above.

In claims 1 and 30, the species zirconia as the polar particulate material is neither taught nor suggested by the prior art. Claim 30 is objected to for depending from a rejected base claim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on 571/272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Frederick L. Barker
Primary Examiner
Art Unit 1762

fjp